Orange (lat. Cītrus × sinēnsis)

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Abstract. The article discusses the main properties of orange and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the fruit are indicated, the use of orange in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of orange on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: orange , beneficial properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

Table 1. Chemical composition of orange (according to Food+).

100 g of fresh oranges contains [33]:					
Main substances:	G	**Minerals:**	mg	**Vitamins:**	mg
Water	86.75	Potassium	181	Vitamin C	53.2
Carbohydrates	11.75	Calcium	40	Vitamin PP	0.282
Sugar	9.35	Phosphorus	fourteen	Vitamin B6	0.060
Alimentary fiber	2.4	Magnesium	ten	Vitamin B2	0.040
Squirrels	0.94	Iron	0.10	Vitamin E	0.18
Fats	0.12	Zinc	0.07	Vitamin B1	0.087
calories	47kcal				

Use in medicine

Speaking about the use of pulp and juice of oranges in medicine, they usually mean the light laxative, diuretic and choleretic effect produced by the product, anti-sclerotic effect, accompanied by a decrease

in the permeability of the walls of blood vessels and their strengthening. In addition, numerous medical studies have established a number of other useful properties of the product.

- **Antioxidant action.** The anthocyanins contained in oranges, acting as antioxidants, reduce the risk of a number of age-related diseases [9] , including cardiovascular and cataracts [10] . Among all the studied plants of the rue family, it is orange that has the most pronounced antioxidant properties [11] . Among other things, it also prevents the development of hypoxia in cells during physical exertion [12] . Similar antioxidant properties are characteristic not only for the pulp, but also for the peel of this fruit [13] .
- **Suppression of the activity of a number of bacteria.** The antibacterial function arises due to the fact that orange juice is able to stimulate the activity of macrophages [16] .
- **Treatment of neurodegenerative diseases.** A hot infusion of orange peels has been shown to inhibit biturylcholinesterase and MAO. And this, in turn, opens up prospects for its use in the treatment of neurodegenerative diseases [20] .
- **Improvement in diabetes.** In diabetes mellitus, an alcoholic extract of the crusts can prevent the development of nephropathies [23] and improve skin regeneration in diabetic patients [24] .
- **Influence on the cardiovascular system.** In the prevention of diseases of the heart and blood vessels , orange juice flavonoids are useful , since they have antioxidant, hypoglycemic and hypolipidemic effects [25] . Juice also "stops" the inflammatory reaction that occurs in the vascular system, due to the consumption of fatty foods [26] . A likely reason for this is a decrease in lipid peroxidation caused by juice antioxidants [27] .
- **Lowering blood pressure.** Orange juice, additionally enriched with a vitamin complex, can lower blood pressure [28] .
- Also, the pulp of orange fruits is recommended in dietary nutrition programs for beriberi and anemia [29] .

In folk medicine

Ancient folk medicine used orange juice mixed with sugar to "expel bile" and "calm down the sharpness of the blood." The standard of medicine prescribed juice for "hot coughs" and for accumulation of "phlegm" in the lungs. To improve mood, get rid of vomiting and nausea, it was necessary to mix 5 grams of grated orange peels with water and drink [30] .

Modern traditional medicine of various peoples is distinguished by regional specifics. So, for example, in Bulgaria, as a sedative, an infusion of orange tree leaves is used at the rate of 3-4 grams of leaves per glass of water. In Italy, orange water is recommended both as a hemostatic agent and as a diaphoretic. A decoction of unripe fruits, women who prefer folk methods, at their own peril and risk, can be used for uterine bleeding [5] .

In the East, the dried peel of the fruit was also traditionally used for heavy discharge during menstruation, and was also prescribed for fevers. Hot infusions were made on the flowers of the orange tree and the bark, which were considered a good sedative. These same infusions, according to tradition, helped to improve appetite. [4] , which partially echoes the modern ideas of nutritionists.

In scientific research

Scientists are actively researching orange fruits, as they have a large number of useful elements. For example, these citrus fruits help improve the condition of the liver. Studies have shown the ability of orange juice to prevent the development and inhibit fatty degeneration of the liver [14] .

Researchers believe that oranges are also useful in the treatment of asthma. The anti- asthma effect was demonstrated in an experimental study by the hesperidin and naringenin contained in the juice . [15] .

In addition, alcoholic extracts of orange peels in the experiment demonstrated an inhibitory effect on the famous Helicobacter bacterium. pylori [17] . In addition to it, the bark extract also has a bactericidal effect on microorganisms such as Klebsiella . pneumonia , Escherichia coli , Staphylococcus aureus , Shigella flexneri and others [18] . This number also includes pathogenic microbes of the oral cavity [19] .

Aqueous extracts of oranges are able to inhibit acetylcholinesterase , which makes their therapeutic use in Alzheimer's disease possible [21] . Placebo-controlled and randomized trials have demonstrated improvements in cognitive function in the elderly with long-term orange juice intake [22] .

Weight regulation

There is an opinion among the people that an orange "burns fats", so with its help you can quickly lose weight. In fact, this mechanism is indirect and manifests itself through the action of a substance called " naringin ". As nutritionists explain, when naringin enters the liver of a well-fed person, a signal is triggered that tells the body that it is hungry and needs to start burning fat to replenish energy. However, the same nutritionists warn that this “orange weight loss” can lead to tangible results only if you eat several dozen fruits at once, which is both difficult and unsafe, like any abuse.

However, on the basis of oranges, some nutritionists develop their own diets. So, for example, Margarita Koroleva, known in the media as a nutritionist of the "stars" (since Valeria, Anita Tsoi, Nikolai Baskov are seen among her clients), created a short-term "Orange Diet", which allows you to reduce weight up to 5% of the original. The weight loss program is designed for 2 (maximum 3) days. During this time, you can eat only oranges and the protein of boiled eggs, and meals should be made every hour. This rhythm is based on the idea of activating metabolic processes, which help to lose weight.

It is important that when we talk about orange juice, we always mean freshly squeezed juice. If we take fresh juice, store-bought reconstituted juice and nectar for comparison, fresh juice (70.9 mg) will have the most vitamin C per 100 grams, and reconstituted juice will take second place (57.3 mg). Nectar will be in third place with 53.2 mg of the vitamin, but the gap from second place will be insignificant.

The term "reconstituted" in relation to orange juice is applied to a product made from concentrated juice by dilution. Sometimes the juice is only pasteurized and in this form (without dilution from the concentrate) is delivered to the shelves. In this case, the packaging will be marked: abbreviation: " NfC " and / or the full inscription " Not from Concentrate " ("Not from concentrate"). But such juice always undergoes heat treatment.

For the industrial production of juices, both expensive varieties rejected due to their size and appearance, and special varieties with reduced consumer properties are used - from those that are poorly cleaned, have a small size and unsightly appearance (for example, a very juicy Salustiana variety , actively cultivated in Valencia).

In other words, the juice itself is often made from the same oranges, which, in the form of a whole fruit, lie side by side on the counter. And nutritional restrictions arise not so much because of the raw materials themselves, but because of the way store-bought juice is prepared, in which a lot of sugar is always added. Orange nectar in this parameter is the most harmful of the juice options. It contains

about 11.8 mg of sugar, reconstituted - about 11 mg, and freshly squeezed - 8.9 mg of sugar per 100 grams.

In cooking

In a normal (non-dietary) diet, an orange is included in numerous dishes of various cuisines of the world. This fruit traditionally goes well with vegetables, fish, poultry meat. For example, when preparing duck with orange sauce, finely chopped chili, a pinch of sugar and salt are added to freshly squeezed juice. Then this composition is brought to a boil. And to complete the preparation of the sauce of the preferred consistency and density, starch diluted with water is slightly poured into the mixture in a thin stream.

Salad recipes often use both the pulp and zest of citrus. But the range of uses of oranges is much wider. From them - more precisely, from orange peels - they even make mustard, which is known in Italy as a traditional seasoning for meat. The crusts are brought to the factory in salt water (preservative), and after washing, they are boiled in syrup. To preserve the aroma and taste of the zest, add a little sugar - just so that the sweetness is absorbed. Figs, pears and peaches help diversify the taste. A fragrant orange oil is obtained from the zest. Even wild bitter oranges are not thrown away. They prepare a specific jam with a spicy taste.

There are two basic culinary techniques that make it easier to make oranges yourself:

1. To make it easier to separate the peel from the pulp, cooks make special cuts. If we draw an analogy with the globe and the terminology adopted by geographers, then the “caps” are cut off at both “poles” of the fruit, and then 5-6 cuts are made along the “meridians”.
2. To make it easier to squeeze the juice from the pulp, the fruit is cut in half and put in the microwave for half a minute (power about 500 W). This allows the separating membranes to be destroyed and the juice to flow out more easily.

In cosmetology

The benefits of home use of face masks made from grated zest have found indirect confirmation in the research work of cosmetologists. According to scientists, orange peel can prevent oxidative stress and prevent inflammatory reactions in skin cells provoked by ultraviolet radiation [31] . Only for this, the selected substances must be correctly combined with other ingredients in the cream.

Cosmetic benefits have also been found in orange juice. It turned out that the processes of yeast fermentation in it not only do not reduce the content of biologically active substances [32] , but, on the contrary, increase the content of flavonones , carotenoids and melatonin [33] . Orange juice hesperidin can inhibit trypsin and the enzyme tyrosinase , and also promotes melanin formation in the skin. Due to the abundance of vitamins and carotenoids , drinking orange juice reduces the harmful effects that drinking alcohol has on skin cells.

Unconventional use

The notion that oranges can poison fats is reflected in an unconventional way of using them: in Jamaica, oranges are used to clean floors by cutting the fruit into slices, and in Afghanistan, housewives wash fats off dishes with juice.

The effectiveness of these techniques can be easily checked on your own, for example, by squeezing juice onto a greasy plate. This method of washing clearly loses to store detergents, but in the absence of "chemistry" or with a conscious rejection of it, it can be considered an acceptable alternative.

Thanks to their natural aesthetics, dried oranges can be used to make an original Christmas tree decoration, especially if thinly sliced oranges are illuminated with garland bulbs.

Dangerous properties of orange and contraindications

People appreciate the benefits of an orange for the economy of countries and for the health or pleasure of each individual. However, this fruit also has dangerous properties that nutritionists and hygienists pay attention to.

The danger of eating the pulp of orange fruits and juices based on it is associated mainly with three factors:

- **Factor No. 1. The effect of an acidic environment on tooth enamel.**

Even with just one orange slice or a few sips of juice, the pH changes , which leads to an increase in the level of acidity in the mouth and threatens to destroy tooth enamel. Shop juices in this sense are even more dangerous due to the high sugar content in the composition. Therefore, hygienists recommend drinking orange juice through a straw to reduce its contact with the teeth. In addition, after eating, it is better to rinse the mouth with water. This will lower the acid concentration.

- **Factor number 2. The reaction of the body to a large amount of juice drunk (eaten oranges) with a potential threat of gastritis.**

Much here depends on individual tolerance. But if one person, without harm to himself, can drink freshly squeezed juice from a dozen fruits on an empty stomach every morning, then another person will most likely soon “earn” gastritis, which nutritionists warn about. The abuse of this fruit does more harm than good.

- **Factor #3. Unpredictable reaction to the combination of naringin with drugs.**

The substance naringin contained in oranges reacts with human liver enzymes. As a result of the interaction, there is a distortion of the intended effect of medicines - it is difficult to predict how the medicine will work. And when alcohol is added to the medicinal-orange "cocktail", cirrhosis of the liver can develop literally within a few weeks. Even regular paracetamol can be dangerous when taken with orange juice. Similar cautions apply to juice and other citrus fruits.

monuments

The monument to the orange, erected in Odessa, tells an episode from the history of the city, and the monument in Tel Aviv tells the story of a whole nation:

1. **Ukraine.** In 2004, a monument to the orange was created in Odessa - the legendary savior of the city from decline. The sculpture is a 12.5-meter (in diameter) bronze fruit mounted on a pedestal, which is carried by three horses. Several slices are “taken out” and replaced by the figure of Paul I. The presence of the figure of the emperor and horses illustrates the story of how in the winter of 1800 the city magistrate sent 3,000 perfect oranges to Paul, hoping to receive a loan of 250 thousand rubles in order to resume the construction of the port. The idea worked and the city received funding.
2. **Israel.** The Soaring Orange Tree in Old Jaffa was created in 1993. According to one version, it symbolizes the fate of a nation that has existed for a long time "in limbo", without roots immersed in its land - without its own state. The composition is a living orange tree growing in a large egg-shaped pot suspended on cables.

3. **Turkey.** In this "orange" country, there are many sculptural compositions and fountains that play with the theme of the orange fruit.

In art

Many Soviet children first learned about such a fruit as an orange from the *cartoon about Cheburashka* . The protagonist was an unknown animal that lived in the rainforests, but ended up in a big city thanks to the fact that he climbed into a box of oranges, where he fell asleep.

The name of the fruit is also found in the title of the famous "adult" book by Anthony Burgess " *A Clockwork Orange* ", which was later filmed by Stanley Kubrick. This name appeared due to the consonance of the Malaysian word “ orang ”, which translates as “man”, and the English word “ orange ”, translated as “orange”. In giving the title to his book, Burgess played on an idiomatic expression used by London workers who called unusual, bizarre and strange things without a clearly defined purpose "crooked like a clockwork orange."

In Kira Muratova's film " *Short Encounters* ", an orange is presented as a symbol of the meeting of the invisible world of deep experiences and the world of higher existential meanings.

Botanical description

Oranges in Russian are the fruits of the *rue family, the orange* subfamily , the genus *citrus* . The generally accepted word for the name of the fruit came from the Dutch language, along with the first deliveries of these fruits (more precisely, berry-like fruits) to Russia.

origin of name

Today, in the literary Dutch language, the use of the name “ *sinaasappel* ” is considered correct, and the word “ **appelsien** ” is marked by Dutch etymological dictionaries as a regional tracing paper from the French phrase “ *pomme de Sine* ", which translates as " **Chinese apple** " [1] . This mention of China directly points to the country from which the history of the orange originates.

Story

Southeast Asia and China are considered to be the birthplace of oranges, where these trees were cultivated two and a half thousand years BC. e. It is assumed that the first fruit trees of this species were the result of crossing tangerines and pomelo. Orange came to Europe through Spain by about 1100 and then, with the beginning of the conquest of the New World, it was “relocated” (introduced) to America. It is known that by 1579 orange trees were bearing fruit in St. Augustine , on the Atlantic coast of northeast Florida.

From about the 1870s in the United States, oranges, which were previously propagated by growing seeds, began to be cultivated using budding (eye grafting). This made it possible to reduce the degree of progeny variability, to achieve a more stable varietal identity, and with a purposeful expansion of species diversity, this made it possible to use as rootstock those citrus species that were better adapted to local conditions: climate, soil, diseases.

The United States today ranks second after Brazil in terms of orange harvest and first in terms of juice production [2] . China, Mexico, Egypt, Turkey, Pakistan, India, Spain, Italy, and Iran play a significant role in the cultivation and export of oranges. In industrial volumes, the fruits are also collected in Greece and South Africa.

Nowadays, the location of orange plantations depends, first of all, on suitable climatic conditions. However, at the end of the 16th century, with the advent of fashion for oranges in the high society of France, a structure was constructed to preserve and grow heat-loving oranges “for beauty”, which got its name from the French word “ orange ”, which in French means “orange”, - greenhouse. Greenhouses gained popularity and began to decorate rich houses not only in the south of Europe, but also in more northern countries.

In the Soviet Union, oranges began to appear relatively widely on the shelves during the reign of Nikita Khrushchev. Moreover, then mainly one was exported, the Israeli variety Jaffa , named after the old name of the port city, from which Tel Aviv later “grew”. The popular variety took root in other countries, but it was brought to the USSR exclusively from Israel, thanks to the “orange deal” under N. Khrushchev. Its essence was that the property located on the territory of Israel, which once belonged to the Russian Empire and later passed to the USSR, was decided to be sold under Khrushchev. The amount of the deal was about 4 million dollars, a significant part of which the Soviet Union received in the form of orange tranches.

Today, some varieties, while retaining their taste, have lost their economic importance for the economies of the producing countries. This happened with the Jaffa variety , which, due to the high cost, was no longer exported. But it was replaced by many other varieties of orange, the total number of which in various sources varies from several tens to several hundreds.

Growing features

Depending on the variety, orange trees can reach different heights: from meter-long indoor "bushes" to 12-meter plants. Some trees live up to 150 years, bringing about 35-38 thousand fruits in harvest seasons. The average age of orange trees is about 75 years.

The crown of this citrus can be both pyramidal and rounded. The oval leaf of the plant with a sharp end and sometimes wavy edges contains aromatic oils in special glands near the surface. The life span of such a leaf is an average of 2 years. On the shoots of plants of a number of varieties, 8-10 cm spikes are found.

Flowers up to 5 cm in diameter can be pink and white and grow in inflorescences of 6 pieces, as well as single flowers. They are in the bud stage for about a month, and then, having blossomed, they fade in 2-3 days. The flowering time of the whole tree takes about two weeks. During this time, the local beekeepers try to pump clean and transparent orange honey, which has a characteristic light texture.

At home, an orange can be grown from a stone in a pot with one part of peat and one part of flower soil. Such trees are characterized by intensive growth, beautiful and dense crown, unpretentiousness and disease resistance. But the plant begins to bear fruit only by the age of 8-10, while all the genetic features of the "parent" are not inherited by its fruits. To preserve genetics, it is more expedient to make cuttings or buy a ready-made seedling.

The plant loves bright diffused light and an air temperature of about 17-28 C. At the same time, flowering occurs at 15-17 C. In plantation conditions, harvesting begins by mid-autumn and ends only by spring.

Varieties

Among the numerous varieties of oranges, some stand out for their special juiciness, others for sweetness or bitterness, and others for their unusual appearance. So, for example, for a wild type of orange, whose trees grow right on the streets throughout the Mediterranean, a very bitter taste is

characteristic. For this reason, its fruits lie under the trees right on the sidewalks, attracting tourists from the northern countries, but leaving the locals indifferent. Sometimes they are used to make jam or used as decorations. Among the mass-cultivated oranges, however, one can single out “special” varieties with their own unique specifics.

The most popular varietal group in the world is the *Navel group* . The English word " *navel* " translates as " **navel** ", which indicates a characteristic feature of the representatives of these varieties: a mastoid rounded outgrowth on the "crown", which is a reduced second fruit. The larger the navel, the sweeter the pulp will be. Navel trees do not have thorns, making them easy to harvest. The fruits themselves are distinguished by widely demanded consumer qualities: sweetness with a slight sourness, strong citrus aroma, juiciness and a relatively easily detachable peel. Some members of the group, such as the early variety *Navelina* , have thin skins. And another representative of the group - *Cara cara navel orange* , distinguished by ruby-colored pulp.

Blood Orange group of varieties is united by the presence of pigments in the pulp, which make it a blood-red color. The pigment appeared in the course of a natural mutation and was first found in Sicily, for which the fruits of this group received the alternative name " *Sicilian oranges* ". The color depends not only on the variety, but also on the growing conditions. The flesh of blood oranges has a sweet and sour taste. The peel separates relatively poorly. Depending on the particular variety, it may have a brown, reddish or orange color. The most famous varieties of the group are: **Moro** with flavors of wild berries and raspberries, *Sanguinello , Tarocco* and some others.

As for ordinary oranges, among other groups, these fruits stand out for their attractive industrial characteristics: they give very large yields, tolerate road well and have a long shelf life. The most famous varieties of ordinary oranges are Verna , Hamlin , Salustiana .

In addition to the groups described, there are numerous orange hybrids from which a separate rating could be made: citrange , clementine , tangor , agli- fruit, etc. The Thomasville hybrid looks the most bizarre , which, in addition to orange, was formed by kumquat and poncirus . In shape, it is more like a fleshy pear.

Selection and storage

Oranges most often reach the consumer in good condition, because citrus producers and suppliers are financially interested in making their products as profitable as possible on the counter. Therefore, oranges for transportation are removed slightly unripe, washed and coated with wax, which includes fungicides that inhibit the activity of fungi. The concentrations of the pesticide in wax are very low and safe for humans, even if accidentally ingested with food. After processing, each fruit, if it is expensive varieties, is wrapped in unglued paper and packaged in boxes of several hundred pieces.

The selection of oranges for sale involves the rejection of small, damaged and scratched fruits. However, before buying, it is best to make a visual inspection of the integrity of the peel yourself. The fact is that there are a lot of flies on citrus plantations, which, using microdamages in the peel of the fruit, lay eggs in the skin of the fruit. In this case, micro-holes with darkening around them are visible on the surface. The removal of such fruits is usually handled by harvesters, but does not place additional control.

Fruits are most often affected by insects on those plantations where chemical processing is used to a minimum. As a rule, this method of cultivation is typical for "organic farming" and the cultivation of organic products. These fruits are more expensive than those grown with pesticide protection, but they are guaranteed to be nitrate-free. On such plantations, a bacterial composition can also be locally sprayed, which destroys the most dangerous pests for oranges, but is harmless to humans. Often,

conditionally beneficial insects (for example, beetles that eat aphids) are used to control conditionally harmful insects.

Despite ongoing research, it was not possible to identify differences in compositional and utility parameters between organically grown products reaching the consumer and products that were harvested after treatment with normalized doses of various preparations. However, demand here not only dictates supply, but also helps some countries to support the industry and not lose competition to the “cheaper” suppliers of oranges to the market.

The duration of storage of citruses depends mainly on the degree of ripeness at the time of purchase, temperature and humidity. Without any special conditions, ripe oranges can be stored for about a week. To increase the storage time up to 1.5-2 weeks, it is better to put the fruits in the compartment of the refrigerator intended for fruits.

If we are talking about long periods of storage, then you can focus on the following temperature-humidity ratios:

- For unripe oranges, the period can be extended to 5 months by creating conditions for them with a temperature of 5 ° C and a humidity of about 80-85%.
- Fruits with yellowed skin are stored for up to 3 months at a temperature of 3-4 ° C at a humidity level of 85-90%.
- Ripe fruits can be preserved for up to 2 months if the temperature is reduced to 2 ° C and the humidity is raised to 90%.
- It is better to pack the fruits not in a plastic bag, but in napkins (each fruit separately).

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An extended HTML version of the article is available on the edaplus website . info .

Orange - useful properties, composition and contraindications

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Abstract. The article discusses the main properties of orange and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the fruit are indicated, the use of orange in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of orange on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application.